



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
24.08.2016 Bulletin 2016/34

(51) Int Cl.:
H03H 7/42 (2006.01) **H03H 7/24** (2006.01)
H01L 23/64 (2006.01) **H01L 27/08** (2006.01)
H03K 5/02 (2006.01) **H01C 13/02** (2006.01)

(43) Date of publication A2:
06.04.2016 Bulletin 2016/14

(21) Application number: **15184432.1**

(22) Date of filing: **09.09.2015**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA

(71) Applicant: **NXP B.V.**
5656 AG Eindhoven (NL)

(72) Inventor: **van der WEL, Arnoud**
Redhill, Surrey RH1 1SH (GB)

(74) Representative: **Terblanche, Candice Jane**
NXP Semiconductors
Intellectual Property and Licensing
Red Central
60 High Street
Redhill, Surrey RH1 1SH (GB)

(30) Priority: **11.09.2014 US 201414484129**

(54) **RESISTIVE DIVIDER CIRCUIT FOR A DIFFERENTIAL SIGNAL COMMUNICATIONS RECEIVER**

(57) A resistive divider circuit for differential signaling is disclosed. The resistive divider includes a first branch and a second branch and each branch has an input, a first resistive component comprised of a number of unit resistors, a second resistive component comprised of a number of unit resistors, and an output connected be-

tween the first resistive component and the second resistive component, the output forming a differential mode output. The first resistive component and the second resistive component are comprised of an equal number of unit resistors.

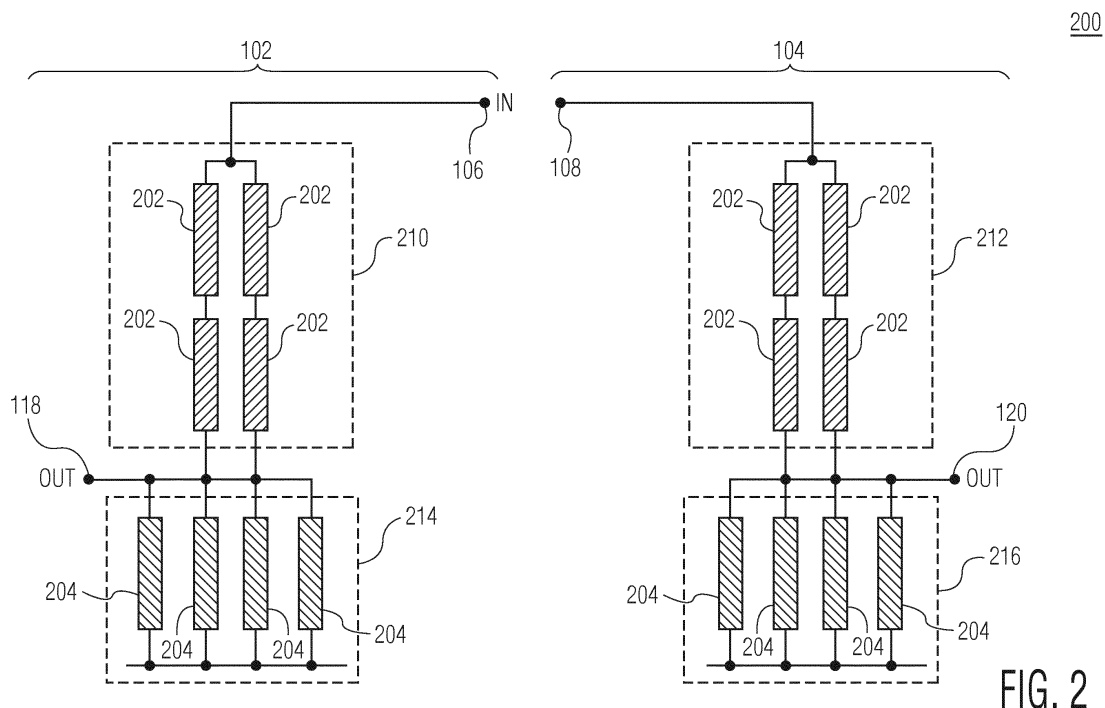


FIG. 2



EUROPEAN SEARCH REPORT

 Application Number
 EP 15 18 4432

5

10

15

20

25

30

35

40

45

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2013/307601 A1 (CASTOR-PERRY KENDALL [US]) 21 November 2013 (2013-11-21)	1-3,7, 10-12	INV. H03H7/42
A	* paragraph [0003] - paragraph [0006] * * paragraph [0017] * * paragraph [0020] - paragraph [0026]; figures 1-7 * * paragraph [0034] *	4-6,8,9	H03H7/24 H01L23/64 H01L27/08 H03K5/02
A	----- WO 2014/041950 A1 (SEIKO INSTR INC) 20 March 2014 (2014-03-20) * abstract; figures 2, 5, 8 * & EP 2 897 290 A1 (SEIKO INSTR INC [JP]) 22 July 2015 (2015-07-22) * paragraph [0028] - paragraph [0032]; figures 2, 5, 8 *	1-12	ADD. H01C13/02
A	----- US 2009/212749 A1 (GOTO TOMOYUKI [JP]) 27 August 2009 (2009-08-27) * paragraph [0028] - paragraph [0067]; figures 1-5 *	1-12	
X	----- US 2008/265969 A1 (WOLTHEK JELLE NICO [NL] ET AL) 30 October 2008 (2008-10-30)	1-3,7, 10-12	TECHNICAL FIELDS SEARCHED (IPC)
A	* paragraphs [0002], [0003] * * paragraph [0015] - paragraph [0027]; figure 2 *	4-6,8,9	H01C H03H H01L H04B G01R H03F
X	----- US 3 530 395 A (PRUSHA GEORGE J) 22 September 1970 (1970-09-22)	1-3,7, 10-12	
A	* column 3, line 59 - column 4, line 63; figures 1-3 *	4-6,8,9	
A	----- JP 2008 172328 A (ROHM CO LTD) 24 July 2008 (2008-07-24) * abstract * * paragraph [0036] - paragraph [0039]; figures 1, 3 *	1-12	
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 20 July 2016	Examiner Patrovsky, Andreas
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

5

50

55

EPO FORM 1503 03.82 (P04C01)



Application Number

EP 15 18 4432

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

**LACK OF UNITY OF INVENTION
SHEET B**

Application Number

EP 15 18 4432

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-3, 7, 9-11

Differential resistive divider circuit comprising an equal number of unit resistors with similar dimensions in each of the first and second resistive components of the differential voltage divider branches

2. claims: 4-6, 8

Differential resistive divider circuit with additional common mode branch

3. claim: 12

Differential resistive divider circuit having corresponding unit resistors of the differential voltage divider branches located adjacent to each other in a rectangular row

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 15 18 4432

5

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

20-07-2016

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2013307601 A1	21-11-2013	US 2013307601 A1	21-11-2013
		WO 2013173051 A1	21-11-2013
-----	-----	-----	-----
WO 2014041950 A1	20-03-2014	CN 104641554 A	20-05-2015
		EP 2897290 A1	22-07-2015
		JP 2014059620 A	03-04-2014
		KR 20150054820 A	20-05-2015
		TW 201428445 A	16-07-2014
		US 2015214836 A1	30-07-2015
		WO 2014041950 A1	20-03-2014
-----	-----	-----	-----
US 2009212749 A1	27-08-2009	CN 101521200 A	02-09-2009
		JP 5433957 B2	05-03-2014
		JP 2009206122 A	10-09-2009
		US 2009212749 A1	27-08-2009
-----	-----	-----	-----
US 2008265969 A1	30-10-2008	AT 392764 T	15-05-2008
		CN 101015178 A	08-08-2007
		DE 602005006130 T2	07-05-2009
		EP 1766908 A1	28-03-2007
		JP 2008506289 A	28-02-2008
		US 2008265969 A1	30-10-2008
		WO 2006006105 A1	19-01-2006
-----	-----	-----	-----
US 3530395 A	22-09-1970	NONE	
-----	-----	-----	-----
JP 2008172328 A	24-07-2008	JP 5000308 B2	15-08-2012
		JP 2008172328 A	24-07-2008
-----	-----	-----	-----